

(No Model.)

J. BUTTERWORTH.
CALENDERING ROLL.

No. 578,543.

Patented Mar. 9, 1897.

Fig. 1.

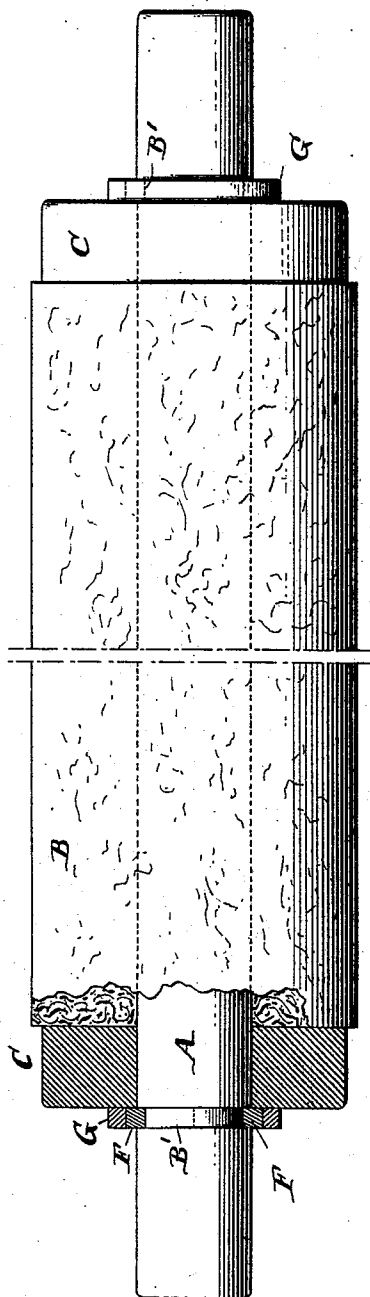


Fig. 3.

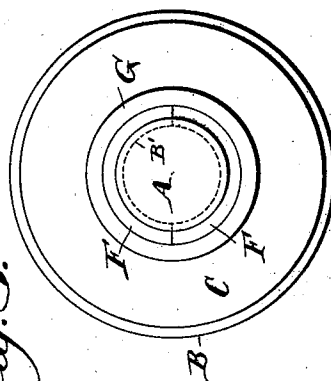
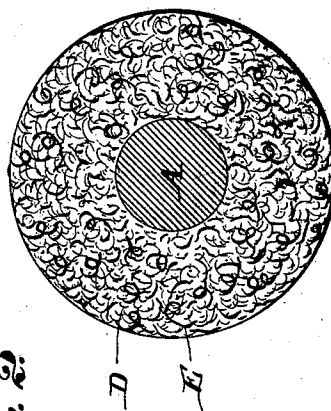


Fig. 2.



Witnesses.

Henry Dwyer
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UNITED STATES PATENT OFFICE.

JAMES BUTTERWORTH, OF PHILADELPHIA, PENNSYLVANIA, ASSIGNOR TO
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CALENDERING-ROLL.

SPECIFICATION forming part of Letters Patent No. 578,543, dated March 9, 1897.

Application filed September 9, 1896. Serial No. 605,269. (No model.)

To all whom it may concern:

Be it known that I, JAMES BUTTERWORTH, of the city and county of Philadelphia, State of Pennsylvania, have invented an Improvement in Calendering-Rolls, of which the following is a specification.

My invention has reference to calendering or polishing rolls; and it consists of certain improvements which are fully set forth in the following specification and shown in the accompanying drawings, which form a part thereof.

Heretofore calendering-rolls for textile machinery have been made of wood alone or of cotton and corn-husks. Those of wood lack the necessary elasticity for producing satisfactory work, and while this defect is in a measure overcome by the combination of cotton and corn-husks the rolls so constructed lack the uniformity of action found necessary. In rolls of this construction the irregular sizes and shapes of the corn-husk constituents cause the roll in the complete state to lack that homogeneity so desirable for perfect work. Its elasticity is not uniform, and it does not respond enough when subjected to a quick blow.

The object of my invention is to produce a calendering or polishing roll which shall secure all the advantageous qualities due to elasticity and at the same time embody a homogeneous structure. To secure this, I employ an intimate mixture of raw cotton and excelsior fiber compressed into cylindrical shape under hydraulic pressure. The excelsior fiber, being uniform in cross-section and essentially of a curly character, intertwines intimately with the cotton fiber to form a structure of uniform composition. When this is subjected to heavy pressure, it permanently retains its shape and close relation, and upon being turned down in a lathe the polishing-surface thereof will present a uniform structure. The polishing due to the excelsior fiber will be evenly distributed, and, furthermore, while being smooth and compact the roll has the quality of yielding to pressure

and quickly recovering from a sudden blow. The excelsior being a well-known article of manufacture, it can be obtained of uniform size, thus insuring uniformity in the composition of the calendering-rolls. This uniformity insures in the finished article a structural character which secures great strength, substantially uniform density, and hence elasticity, and a polishing capacity of equal value throughout its circumference. The possibility of duplicating the polishing-roll is a feature of the greatest importance, since it frequently happens that the new roll must be capable of producing the same polish under the same conditions. This is readily secured by the combination of the uniform excelsior fiber with the cotton fiber, since the two can be most intimately and uniformly commingled.

In the drawings, Figure 1 is an elevation of a calendering-roll embodying my invention. Fig. 2 is a cross-section of same, and Fig. 3 is an end elevation.

A is the shaft or mandrel and has the annular grooves B'.

B is the calendering roll or cylinder, and C C are the metal heads or collars for supporting the fibrous cylinder in position upon the mandrel. To hold the collars in position, I place in the grooves B' two semiannular rings F and shrink upon them the ring G. The cylinder B is made substantially like a tube and is formed in that shape under heavy hydraulic or other pressure upon the mandrel.

D represents the cotton, and E the excelsior.

It will be seen from an examination of Fig. 2 that the excelsior is uniformly commingled or entwined with the cotton fiber. As the cylinder B wears down it will always present the same character of surface, but when worn down it must be removed and replaced by a new cylinder. It will thus appear that the necessity of uniformity in the cylinders or rolls is most important and can be secured when the construction herein set out is followed.

I do not confine myself to any particular

configuration of the polishing or calendering roll, as that may be varied to suit the special use to which the roll is to be applied.

What I claim as new, and desire to secure by Letters Patent, is—

1. A calendering-roll composed of an intimate mixture of cotton and excelsior compressed into the requisite form.

2. As a new article of manufacture a polishing or calendering body composed of a fine

thread-like vegetable fiber such as cotton and excelsior in a greatly coarser form uniformly intermingled and compressed into a solid form.

In testimony of which invention I have hereunto set my hand.

JAMES BUTTERWORTH.

Witnesses:

R. M. HUNTER,

R. M. KELLY.